## Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application.

## Listing of Claims:

Claim 1 (Currently amended): An apparatus comprising a structure, support means extending from the structure, and a system for controlling at least one of the position, alignment, and attitude of the structure in a zero or low-gravity environment, the system comprising targets and means for emitting energy beams directly at surfaces of the targets whereby the targets are ~~and targets~~ impacted by the energy beams to cause ablation of the targets, wherein at least one of the emitting means and the targets is mounted to the support means so as to be positioned apart from the structure, and wherein the system further comprises means for causing the emitting means and the targets to cooperate and selectively induce translation and rotation motion of the structure in any of six independent degrees of freedom in reaction to motion of material ablated from the targets.

Claim 2 (Previously presented): The apparatus according to claim 1,

wherein the emitting means comprises a laser gun and the energy beam thereof is a laser beam.

Claim 3 (Previously presented): The apparatus according to claim 1, wherein the emitting means comprises an electron gun and the energy beam thereof is an electron beam.

Claim 4 (Currently amended): The apparatus according to claim 1, wherein the targets are shaped such that some of the material ablated from each of the targets travels toward ~~and some of the material ablated from each of the targets travels away from~~ the emitting means from which the impacting energy beam is emitted, the structure further comprising means for controlling the amount of the material that collects on the emitting means as a result of being deflected by the targets to travel toward the emitting means.

Claim 5 (Previously presented): The apparatus according to claim 1, wherein the support means comprises braces extending in opposite directions from the structure along at least one axis of the structure, at least one of the emitting means and the targets being mounted to the braces.

Claim 6 (Previously presented): The apparatus according to claim 5, wherein the emitting means comprises at least two energy beam sources mounted to the structure, the targets comprise first and second targets mounted to opposite ends of the braces, and the two energy beam sources and the first and second targets are adapted to cooperate and cause the structure to undergo rotation in reaction to the motion of the material ablated from the first and second targets by the energy beam sources.

Claim 7 (Previously presented): The apparatus according to claim 5, wherein the braces are rigid.

Claim 8 (Previously presented): The apparatus according to claim 5, wherein the emitting means comprises at least two energy beam sources mounted to the structure, the targets comprise a first target mounted to one of the braces, and the two energy beam sources and the first target are adapted to cooperate and cause the structure to undergo translation in reaction to the motion of the material ablated from the first target by the energy beam sources.

Claim 9 (Previously presented): The apparatus according to claim 1,

wherein the targets are formed of at least one of mineral and ceramic materials.

Claim 10 (Previously presented): The apparatus according to claim 1, wherein the causing means comprises means for adjustably aiming the energy beams at the targets.

Claim 11 (Previously presented): The apparatus according to claim 1, wherein the support means comprises braces extending in opposite directions from the structure along three axes of the structure, at least one of the emitting means and the targets being mounted to the braces.

Claim 12 (Previously presented): The apparatus according to claim 11, wherein the emitting means comprises energy beam sources mounted to the structure, the targets comprise targets mounted to opposite ends of the support means, and the energy beam sources and the targets are adapted to cooperate and cause the structure to selectively undergo translation along each of the axes and rotation about each of the axes in reaction to the motion of the material ablated from the targets.

Claim 13 (Previously presented): The apparatus according to claim 11, wherein the emitting means comprises energy beam sources mounted to opposite ends of the support means, the targets comprise targets mounted to the structure, and the energy beam sources and the targets are adapted to cooperate and cause the structure to selectively undergo translation along each of the axes and rotation about each of the axes in reaction to the motion of the material ablated from the targets.

Claim 14 (Previously presented): The apparatus according to claim 11, wherein the emitting means comprises energy beam sources mounted to opposite ends of the support means, the targets comprise targets mounted to the support means adjacent the energy beam sources, and the energy beams emitted by the energy beam sources impact the targets not mounted to the same support means as the energy beam source thereof so as to cause the structure to selectively undergo translation along each of the axes and rotation about each of the axes in reaction to the motion of the material ablated from the targets.

Claim 15 (Currently amended): An apparatus comprising:

a structure;

support means extending from the structure; and

a system for controlling at least one of the position, alignment, and attitude of the structure in a zero or low-gravity environment, the system comprising:

targets;

means for emitting energy beams at the targets whereby surfaces of the targets are impacted by the energy beams to cause ablation of the targets;

means for causing the emitting means and the targets to cooperate and selectively induce translation and rotation motion of the structure in any of six independent degrees of freedom in reaction to motion of material ablated from the targets, ~~The apparatus according to claim 1,~~ wherein the causing means comprises means for adjustably ~~controlling~~ aiming and firing of the emitting means; ~~means.~~

wherein at least one of the emitting means and the targets is mounted to the support means so as to be positioned apart from the structure; and

wherein at least some of the surfaces of the targets are curve-shaped such that some of the material ablated from each of the targets travels away from the emitting means from which the impacting energy beam is emitted.

Claim 16 (Previously presented): The apparatus according to claim 15, further comprising means in communication with the controlling means for sensing at least one of the position, alignment, and attitude of the structure.

Claim 17 (Previously presented): The apparatus according to claim 15, further comprising means in communication with the controlling means for sensing the firing of the emitting means.

Claim 18 (Previously presented): The apparatus according to claim 17, further comprising feedback means that senses at least one of the position, alignment, and attitude of the structure, performs an adaptive learning algorithm to produce modified position, alignment, or attitude data, and communicates the modified position, alignment, or attitude data to the controlling means.

Claim 19 (Previously presented): The apparatus according to claim 1, wherein the structure is a satellite and the motion is a station-keeping maneuver.

Claim 20 (Previously presented): The apparatus according to claim

1, wherein the structure is a spacecraft and the motion is an attitude control maneuver.

Claim 21 (Currently amended): A method for controlling at least one of the position, alignment, and attitude of an apparatus located in a zero or low-gravity environment and comprising a structure and support means extending therefrom, the method comprising the steps of mounting targets to at least one of the structure and the support means, emitting energy beams directly at the targets from at least one of the structure and the support means so that the energy beams impact the targets and cause ablation of the targets to selectively induce translation and rotation motion of the structure in any of six independent degrees of freedom in reaction to motion of material ablated from the targets.

Claim 22 (Currently amended): The method according to claim 21, further comprising at least one step chosen from the group consisting of:

adjustably aiming at least one source of the energy beams on a curved surface of at least one of the targets to prevent at least some of the ablated material deflected by the at least one targets from collecting on the at least one source; and

operating shutters associated with sources of the energy beams to prevent at least some of the ablated material deflected by the targets from collecting on the sources. ~~at least one source of the energy beams.~~

Claim 23 (Original): The method according to claim 21, wherein at least two of the energy beams are emitted in directions away from the structure, the targets are spaced apart from the structure, and the structure undergoes rotation in reaction to the motion of the material ablated from the targets by the at least two energy beams.

Claim 24 (Original): The method according to claim 21, wherein at least two of the energy beams are emitted in directions away from the structure toward a first of the targets spaced apart from the structure, and the structure undergoes translation in reaction to the motion of the material ablated from the first target by the at least two energy beams.

Claim 25 (Original): The method according to claim 21, wherein the energy beams are emitted in directions away from the structure, the targets are spaced apart from the structure, and the structure undergoes translation and rotation in reaction to the motion of the material ablated from the targets.

Claim 26 (Original): The method according to claim 21, wherein the energy beams are emitted in directions away from the structure, the targets are spaced apart from the structure, and the structure undergoes translation along each of three axes and rotation about each of the three axes in reaction to the motion of the material ablated from the targets.

Claim 27 (Currently amended): The method according to claim 21, wherein the energy beams are emitted in directions toward ~~from~~ the structure and the targets, and the structure undergoes translation along each of three axes and rotation about each of the three axes in reaction to the motion of the material ablated from the targets.

Claim 28 (Original): The method according to claim 21, further comprising controlling aiming and firing of the energy beams.

Claim 29 (Original): The method according to claim 21, further comprising controlling aiming and firing of the energy beams in response to sensing of at least one of the position, alignment, and attitude of the structure.

Claim 30 (Original): The method according to claim 21, further

comprising controlling aiming and firing of the energy beams in response to sensing of the motion of the structure.

Claim 31 (Original): The method according to claim 30, further comprising sensing at least one of the position, alignment, and attitude of the structure, performing an adaptive learning algorithm to produce modified position, alignment, or attitude data, and modifying the aiming and firing of the energy beams in response to the modified position, alignment or attitude data.

Claim 32 (Original): The method according to claim 21, wherein the structure is a satellite and the motion is a station-keeping maneuver.

Claim 33 (Original): The method according to claim 21, wherein the structure is a spacecraft and the motion is an attitude control maneuver.

Claim 34 (New): The apparatus according to claim 1, wherein at least some of the surfaces of the targets are curve-shaped such that some of the material ablated from each of the targets travels away from the emitting means from which the impacting energy beam is emitted.

Claim 35 (New): The apparatus according to claim 1, wherein at least one of the targets is impacted by multiple energy beams.

Claim 36 (New): The apparatus according to claim 35, wherein the surface of the at least one target is curve-shaped.

Claim 37 (New): The apparatus according to claim 4, wherein the controlling means comprises means for adjustably aiming of the energy beams at the curve-shaped surfaces of the targets.

Claim 38 (New): The apparatus according to claim 4, wherein the controlling means comprises shutters.